

Alternaria alternata spores shuttled by Peltate trichomes of olive leaf: A mysterious nasal cytology feature

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A 42-year-old man presented severe nasal obstruction, watery rhinorrhea, and hyposmia in autumn 2020. He did not experience similar complaints in the past. However, he suffered from allergic rhinoconjunctivitis during the springs for over 20 years. He was diagnosed with allergy by his family doctor and used to be on oral antihistamines on demand. As the symptoms significantly worsened and were refractory to usual treatment, he consulted the Rhinology Unit of the Foggia University. Skin prick test and serum allergen-specific IgE assay revealed sensitization to *Phleum pratense* and *Alternaria alternata*. The blood test confirmed peripheral eosinophilia (8.7%).

Consequently, we confirmed allergy to grass and *Alternaria* as the symptoms' period was consistent with the pollen and mold seasons. Nasal cytology also was performed by scraping and stained using the May–Grunwald–Giemsa method.¹ The cytology showed the presence of abundant eosinophils in a state of degranulation. Surprisingly, a “mysterious” flower-shaped structure appeared (Figure 1A). This strange structure included some spores of *A. alternata* (Figure 1B).

An extensive and detailed botanical analysis solved the mystery. This structure, known as “Peltate trichomes” (Figure 1C), covers the abaxial surface of the olive leaf, providing the typical slightly silky appearance.² The “Peltate trichomes,” dispersed in the air by the wind, serve as a shuttle for the spores. In this way, the patient inhaled the *A. alternata* spores shuttled by the trichomes. The mold spores triggered allergic symptoms through this unique mechanism. In particular, the exceptional cytological picture represented the first description of this natural phenomenon.

The *A. alternata* genus belongs to the Pleosporaceae family (Ascomycota phylum); it is one of the most important allergenic fungi.³ The mean rate of sensitization to *Alternaria* exceeded 8.9% in Europe.⁴ *Alternaria* allergy represents an important risk factor for the development, persistence, and severity of asthma.³ The genus *Alternaria* species consists of multiple saprophytic, endophytic, and pathogenic species detectable in all habitable regions. *Alternaria* is an invasive pathogen for several plant species, including potatoes and

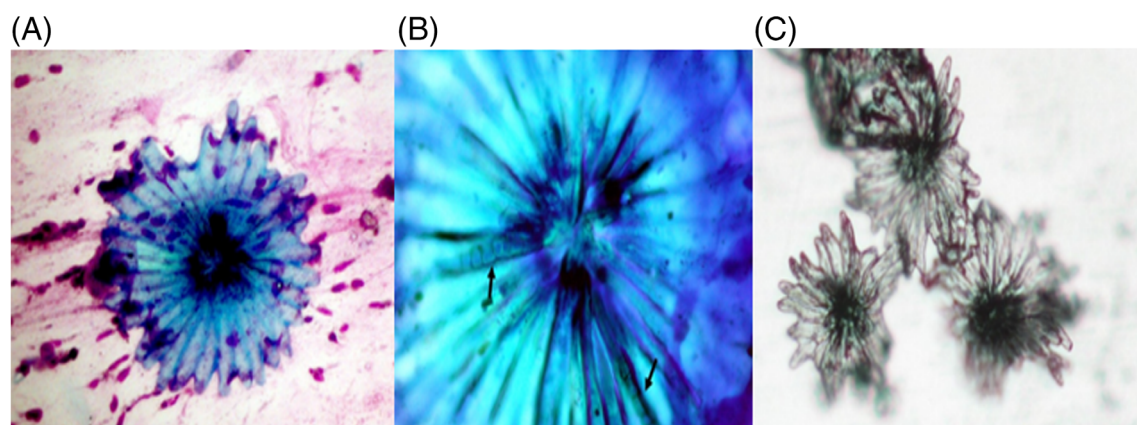


FIGURE 1 A, Presence of degranulated eosinophils and “Peltate trichomes” in the nasal mucosa. B, Peltate trichomes with some *Alternaria alternata* spores inside (arrows). C, Peltate trichomes of the olive leaves

cereals. *A. alternata* produces spores that are usually distinctively club-like, multicellular, and septate and produced in single or branching chains on commonly short, erect conidiophores.⁵ *Alternaria* spores are larger (usually 50–100 µm diameter) than other fungal spores or pollens. Outdoor concentrations of airborne fungal spores have clinical relevance for epidemiological and clinical studies.

Alternaria spores contain a number of allergens belonging to different protein families, for example, heat-shock proteins, dehydrogenases, transferases, and ribosomal proteins. Alt a 1 is the major allergen of *A. alternata*, consistently the outdoor concentrations of Alt a 1 positively correlate with symptom severity of patients allergic to *A. alternata*.⁶

It has to be noted that the patient lives in Puglia, an Italian region characterized by intensive cultivation of olive trees. The abundant presence of olive trees could promote the sensitization to mold allergens, including *A. alternata* in allergic patients. As a result, unexpected presentation of symptoms, such as outside the usual season, requires an appropriate work-up. In this regard, nasal cytology suggested an abnormal feature that deserved careful attention and solved the clinical problem.

CONFLICT OF INTEREST

The authors have no conflict of interest.

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available from the corresponding author upon reasonable request.

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